**REMARKS/ARGUMENTS**

This Amendment is in response to the final Office Action dated May 30, 2008. Claims are 1-20 pending. Claims 1-20 are rejected. Claims 1 and 11 have been amended, and claims 2 and 12 have been cancelled. Accordingly, claims 1, 3-11, and 13-20 remain pending in the present application.

Claims 1 and 11 have been amended to recite allowing a user to designate an unrestricted number of the parameters as independent variables. Support this amendment may be found in ¶ 25.

Claims 1 and 11 have also been amended to incorporate the limitations of canceled claims 2 and 12, respectively. Claims 1 and 11 have also been amended to clarify that $\alpha$ is a weighted parameter for "sensitivity values in the cost function". Support for this amendment may be found in ¶ 28.

Claims 1-20 are rejected under 35 USC 103(a) as being anticipated by "IMD-Software for Modeling the Optical Properties of Multilayer Films" by Windt (hereinafter Windt) in view of "Pattern recognition by optical film-so multilayer model" by Li (hereinafter Li). Applicant respectfully disagrees rejection as to the claims as amended.

The Examiner admits that Windt does not teach obtaining an optimal reflectivity value for complex multilayer stacks that is simulated. The Examiner cites Li for curing the deficiencies of Windt, stating that Li teaches modeling an optical thin-film multilayer model that has not been created. The Examiner stated, "it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the simulated multilayer model of Li with the obtaining of an optimal reflectivity value for complex multilayer stacks of Windt."

However, it is respectfully submitted that a combination of Windt and Li teaches no

more than the prior art software simulation systems described in Applicant's Background, which are limited. For example, although current lithography simulation programs perform reflectivity minimization calculations and help lithographers reduce process development and process optimization times, the reflectivity minimization calculation is performed by fixing two variables and finding the minimum of the function in the remaining variables. Two other variables are fixed, and the process is repeated for each layer. Thus, using conventional lithography simulation programs is a very iterative and time-consuming process, and the results are not usually very accurate. ¶ 7.

As stated in the Applicant's Summary, "the present invention provides a method for obtaining an optimal reflectivity value for complex multilayer stacks that is capable of performing the calculation using multiple variables." Paragraph 25 describes that in one embodiment, "the user chooses which of the *parameters will be independent variables* with feasible intervals by clicking the "Vary" button (e.g., See FIG. 5) and inputting a step value. Those parameters that are not designated as varying will be fixed. According to one aspect of the present invention, *the user may vary any number of parameters*."

Accordingly, independent claims 1 and 11 have been amended to recite that the user is allowed "to input values for the parameters and to designate an unrestricted number of the parameters as independent variables." A combination of Windt and Li fail to teach or suggest allowing the user to designate an unrestricted number of the parameters as independent variables. In fact, it is believed the system of Windt and Li is limited just as the described prior art system because Windt restricts the number of independent variables that can be designated:

> "... it is possible in IMD to designate simultaneously **up to eight independent variables** when computing optical functions and electric-field intensities." Windt, page 364, Part B. Parameter estimation.
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> "...**up to eight independent variables** can be designated simultaneously." Windt, page 366, Part B. Variable designation.

Thus, Windt and Li's system restricts the number of independent variables that a user may designate, whereas in present claims, the user may designate an unrestricted number of parameters as independent variables.

Windt and Li's system also fail to teach or suggest steps (d) and (e) of claims 1 and 11. Step (d) calls for "calculating sensitivity values *S* for the extrema". The Examiner cited the following quote from Windt for teaching this step: "the relative sensitivities of the optical functions to the parameters that describe the multilayer structure." Windt: page 360.

It is respectfully submitted that this quote must be read in context. Windt was describing an interactive visualization tool used to display results of multiple-variable computations in which one can vary a given parameter and see the resulting effect on the optical functions (in one or two dimensions) in real-time. In the quote, Windt was describing that the feature of allowing a user to vary a given parameter and see the resulting effect on the optical functions is helpful discerning the relative sensitivities of the optical functions to the parameters. Thus, Windt was describing an advantage of a feature of his tool, not a calculation that is tool was performing. Note that the quote, and Windt in general, fail to say that any "sensitivity **values"** were *calculated*. Nor does the quote, and Windt in general, say that the sensitivity values for "the extrema" (of a cost function of reflectivity) were calculated, as recited in step (d) of claims 1 and 11. Li fails to cure this lack of teaching by Windt. Li also fails to teach a calculation of sensitivity values for the extrema. Indeed, a text search of Li reveals that Li fails even to mention the term "sensitivity".

The combination of Windt and Li also fail to teach or suggest "obtaining the optimal reflectivity value for the simulated multilayer stack by calculating a cost function $R + \alpha \cdot S$ using the plurality of independent variables at once, wherein $\alpha$ is a weighted parameter for

the sensitivity values in the cost function," as recited in step (e) of claims 1 and 11.

The Examiner cited Li: Section 2, for teaching "obtaining the optimal reflectivity value for the simulated multilayer stack", and cited Windt: page 362 for teaching "calculating a cost function $R + \alpha S$ using the plurality of independent variables at once." However, it has been explained above that Windt and Li fail to teach or suggest "calculating sensitivity values S." Therefore, it follows that Windt and Li cannot teach or suggest "calculating a cost function $R + \alpha S$."

In the rejection of step (d) the Examiner appears to take the position that Applicant's "sensitivity" is equivalent to Windt's diffuseness/roughness variable σ, which is used in Windt's reflection coefficient modification factors w~(s)). Windt: Page 362, col. 1.

However, Applicant does not understand the Examiner's interpretation of sensitivity for at least two reasons. First, the Examiner's interpretation is not consistent with the interpretation of the sensitivity the Examiner gave in the rejection of step (d). It is respectfully submitted the Examiner cannot give alternate theories and see which one sticks.

And second, the Examiner's interpretation is not consistent with the term "sensitivity as used in Applicant's claims or Specification. Applicant's claims 10 and 20, and the Specification in ¶ 27, define sensitivity S in one embodiment as (Max R - Min R), with all varying parameters, which represents how reflectivity values react to the variation of variables. Thus, sensitivity S has nothing whatsoever to do with diffuseness/roughness, as suggested by the Examiner. Since the inventor is his or her own lexicographer, the Examiner must find a reference that meets Applicant's definition of sensitivity in order to sustain on obvious rejection, not one that meet his own.

Because Windt fails to teach the calculation of sensitivity, Windt fails to teach or

suggest the calculation of a cost function $R + \alpha \cdot S$, where a weighted parameter $\alpha$ is applied to the sensitivity in the cost function. Li fails to cure the defects of Windt, since it is believed Li fails wholly to even mention the term sensitivity.

Claims 1 and 11 are thus allowable over Windt. Applicant submits that claims 3-10 and 13-20 are allowable because they dependent these allowable base claims.

In view of the foregoing, it is submitted that claims 1, 3-11, and 13-20 are allowable over the cited reference. Accordingly, Applicant respectfully requests reconsideration and passage to issue of claims 1, 3-11, and 13-20 as now presented.

Applicants' attorney believes this application in condition for allowance. Should any unresolved issues remain, Examiner is invited to call Applicants' attorney at the telephone number indicated below.

Respectfully submitted,

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